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(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**23.05.2001 Bulletin 2001/21**

(51) Int Cl.7: **A47C 4/02, A47C 5/06**

(21) Application number: **00203832.1**

(22) Date of filing: **02.11.2000**

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU**  
**MC NL PT SE TR**  
 Designated Extension States:  
**AL LT LV MK RO SI**

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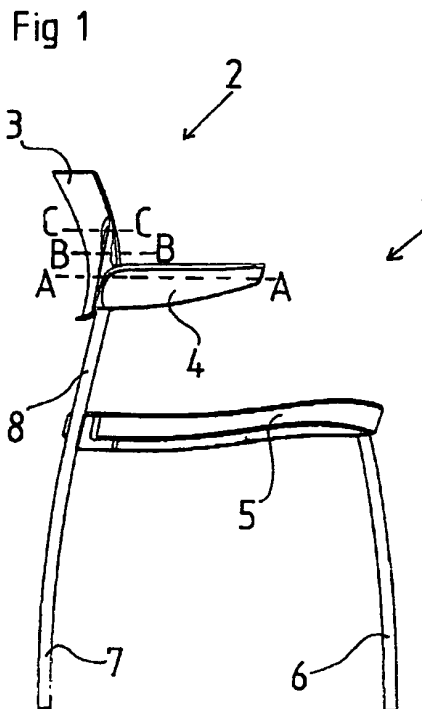
(30) Priority: **16.11.1999 SE 9904126**

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(54) **Chair**

(57) A chair (1) comprises a leg frame, a back support (3) and a seat (5). The leg frame consists of two separate halves. A part of each one of these halves extends in beneath the seat (5) from each side of it and is secured in a body portion of the seat (5) by means of snap- or insert connections. The parts which extend in beneath the seat (5) are advantageously accommodated in undercut recesses (17, 18, 19) which are disposed on the underside of the seat (5). Further, these parts have at least one manifest curve (13, 14) each and they lie substantially in one and the same plane. The back support (3) has downwardly open accommodation spaces (30) for accommodating two uprights (8) which extend upwards from each respective half of the leg frame.



**Descripti n**

symmetric body portion of the seat;

**TECHNICAL FIELD**

Fig. 5

is a sectional view of the body portion taken along the line D-D in Fig. 4;

[0001] The present invention relates to a chair comprising a leg frame, a back support and a seat.

Fig. 6

is a straight side elevation of the padding or cushion for the seat; and

**BACKGROUND ART**

[0002] Chairs which have a frame or a body structure of metal tubing have long been known in the art. A large number of these chairs have a leg frame which is disposed centrally beneath the chair seat, which implies that they are quite bulky on transport and storage since they are neither stackable nor, in the dismantled state, can be packed in substantially flat packages.

Figs. 7a,b,c

are horizontal sections taken along the lines A-A, B-B, and C-C in Figs. 1 and 2 through one half of the symmetric back support.

[0003] Other chairs have metal tubing frames where the legs are disposed in the corners of the seat. In certain cases, these chairs are stackable or nestable in one another, but in the dismantled state the leg frame is nevertheless bulky.

**DESCRIPTION OF PREFERRED EMBODIMENT****PROBLEM STRUCTURE**

[0004] The present invention has for its object to realise a stackable chair which consists of few parts, is simple to assemble and dismantle and which may be transported and stored in substantially flat packages when it is dismantled.

[0007] Fig. 1 shows the chair 1 according to the present invention straight from the side. The back portion 2 is built up from a back support 3 and two arm supports 4, of which only one is visible in Fig. 1. The back portion 2 is disposed on the upper region of the leg frame, the upwardly directed stiles or uprights 8. The uprights 8 extend down past the seat 5 and merge in the rear legs 7. At the front edge of the seat 5, the chair 1 has two front legs 6. Since the legs 6 and 7 are disposed in the corners of the seat 5, and extend somewhat outwards seen from the central region of the seat 5, the chair 1 is stackable.

**SOLUTION**

[0005] The object forming the basis of the present invention will be attained if the chair intimated by way of introduction is characterised in that the leg frame consists of two separate halves, a part of each one of them extending in beneath the seat from each side thereof and being secured in a body portion of the seat by means of a snap- or insert-connection.

[0008] Fig. 2 shows the chair straight from behind. In this view, it will be seen that the mutual spacing between the rear legs 7 is greater than the distance between the front legs 6.

[0009] Seen in the width direction, it will also be noted that the rear legs 7 lie outside the seat 5. These features are important in order that chairs according to the present invention can be stacked or nested on one another.

**BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS**

[0006] The present invention will now be described in greater detail hereinbelow, with reference to the accompanying Drawings. In the accompanying Drawings:

Fig. 1 is a straight side elevation of a chair according to the present invention;

Fig. 2 is a straight front elevation of the chair according to the present invention;

Fig. 3 is a perspective view obliquely from above of the two separate halves of the leg frame;

Fig. 4 is a top plan view of one half of the

[0010] Figs. 1 and 2 show overviews of all of the components included in the chair 1. These components are few in number, which facilitates assembly and dismantling. The parts are the back portion 2 (which includes the back support 3 and the arm supports 4 in one piece construction), the leg frame (which is manufactured in two separate halves), and the seat 5 (in which is included a removable pad or cushion). Since the components are few in number and are connected to one another by means of snap- or insert connections, assembly is a simple operation. If necessary, the union may be reinforced by means of screws or the like. A further advantage is that the chair in the dismantled state may be packed in packages which are of minimal bulk, whereby storage and transport will be more economical.

[0011] Fig. 3 shows the leg frame in the position which the frame and its two halves assume in the assembled chair. As was mentioned above, the frame consists of two halves which, in their front end, have a front leg 6 and, in their rear end a rear leg 7. A curved rail 9 extends between them. The curved rail 9 extends transversely of the two legs 6 and 7 and lies substantially in a single

plane which is essentially horizontal. The curved rail 9 is built up from three main sections. These sections are : a rear tubular section 10, an interjacent tubular section 11 and a front tubular section 12.

[0012] The rear tubular section 10 is secured at the rear leg 7 preferably by welding. In the same manner, the front tubular section 12 is secured to the front leg 6. The interjacent tubular section 11 between the rear tubular section 10 and the front tubular section 12 is connected to the two tubular sections 10 and 12 in the curves 13 and 14. The curves 13 and 14 are preferably realised by bending of the tube included in the curved rail 9.

[0013] The rear tubular section 10 extends from the rear leg 7 approximately in a direction towards the centre point of the seat 5. In the preferred embodiment, the length of the rear tubular section 10 is roughly half of the distance from the corner up to the centre point of the seat 5. At the transition to the interjacent tubular section 11, the tube included in the curved rail 9 is bent at an obtuse angle for forming the curve 13.

[0014] The interjacent tubular section, whose length is of the same order of magnitude as half of the length of the seat 5, extends from the curve 13 gently outwards towards the side edge of the seat 5 up to the curve 14 which, like the curve 13, is formed from the tube which has been bent at an obtuse angle. In the preferred embodiment, the angle between the rear tubular section 10 and the interjacent tubular section 11 is less than the angle between the interjacent section 11 and the front tubular section 12.

[0015] The front tubular section 12 extends from the front leg 6 approximately in a direction towards the centre point of the seat 5 and meets the interjacent tubular section 11 in the curve 14. Like the length of the rear tubular section 10, the length of the front tubular section 12 is roughly half of the distance between the corner of the seat 5 and its centre point. The curved rail 9 extends at most up to about a third of the width of the seat 5, counting from the side edge of the seat 5. Both halves of the frame are mirror images of each other.

[0016] An upwardly directed stile or upright 8 extends upwards from the rear leg 7. The upright is preferably of one piece manufacture with the rear leg 7. The two uprights 8 are each connected to their side of the back support 3. This connection is preferably an insert connection and, in order that this union attain the desired stability, the upper ends of the uprights 8 are bent slightly outwards seen from the vertical plane of symmetry of the chair 1.

[0017] Fig. 4 is top plan view of the body portion 15 of the seat 5 when the pad or cushion of the seat 5 has been removed. Since both the seat 5 and its body portion 15 are symmetric, only one half of the body portion 15 has been shown on the Drawing. In the rear corner of the body portion 15 which is turned to face towards the rear leg 7, there is disposed a snap connection or a guide 16. Decisive for whether the guide 16 is to be con-

sidered as a snap connection is the size of the angle of enclosure. If more than half of the rear leg 7 is enclosed, i.e. if the angle of enclosure is greater than  $180^\circ$ , the guide 16 will instead function as a snap connection. In both cases, the guide or the snap connection 16 is in the form of a segment of a circle in cross section. Moreover, it has a certain axial extent along the circumferential surface of the rear leg 7.

[0018] A curved, downwardly open profile extends from the rear corner and in beneath the seat. The profile is of substantially U-shaped cross section, whose size is such that the curved rail 9 of the frame is accommodated in the profile. The profile is substantially built up from three sections: a rear profile section 17, an interjacent profile section 18 and a front profile section 19. At at least one, but preferably several points along the profile, there are snap connections 20 for holding the frame fast in the profile.

[0019] The configuration of the profile corresponds substantially with the configuration of the curved rail 9. The three profile sections 17, 18, 19 are interconnected with one another in a rear curve 21 and a front curve 22. [0020] In order to increase the strength of the body portion 15, it is provided on its upper side with a number of reinforcing springs 23, 24. The central reinforcing springs 23 are disposed in the central region of the body portion 15, in the preferred embodiment as a circle and a cross. Side reinforcing springs 24 are disposed along the edges of the body portion 15.

[0021] Fig. 5 shows a section through the body portion 15 taken along the line A-A in Fig. 4. The reinforcing springs 23 are clearly apparent here, on either side of the interjacent profile section 18. Further, the cross-sectional configuration of the profile section 18 is clearly apparent. The side reinforcing spring 24 is also shown in the outer edge of the body portion 15.

[0022] Fig. 6 is a side elevation of the pad or cushion 25 disposed on the body portion 15. The upper side of the pad is provided with fabric-clad upholstery 26. On its underside, there is a bottom plate 27 on which are disposed snap connections 28 which engage with the anchorages 29 as shown in Fig. 4.

[0023] Figs. 7 a, b and c show sectional views at different levels on the back support seen from above. The sectional view in Fig. 7 a corresponds to a section taken along the line A-A in Figs. 1 and 2, the view in Fig. 7 b corresponds to a section taken along the line B-B, and so on. Since the back support is symmetric, only one half of it is shown. As was mentioned above, the upwardly directed stiles or uprights 8 are passed into an insert connection in the back portion 2. The design of the insert connection is such that the back portion 2 has been provided with a downwardly open cavity 30. In the preferred embodiment, the cavity displays a somewhat irregular cross section which may be described as being triangular even though its corners are rounded and sides somewhat curved. The cross section of the cavity is of an appearance which varies with the distance from

the lower edge of the back portion 2. The area and circumference of the cross section are at their greatest in the lower edge and reduce the further away from the lower edge they are. This implies that an upright 8 which is pressed into the cavity is more reliably fixed in place the further in it is moved. The upright 8 is held in position by the friction between it and the inside of the cavity 30.

[0024] On assembly of the back portion 2, the two uprights are moved a slight distance towards one another in order to be able to fit into the cavities 30 on each side of the back portion 2. Since the upper region of the uprights 8 is slightly outwardly directed, this entails to an even greater extent that they must be moved towards one another to fit into the cavities 30. When the back portion has been assembled, the uprights will once again strive outwards and thereby fix the back portion 2 in place. At the same time as the uprights 8 strive outwards when the back portion 2 has been assembled, the back portion 2 positively retains in position not only uprights 8 but also the rear legs 7 which are forced inwards towards the seat 5 at the guides or snap connections 16.

[0025] In other words, the back portion 2 urges the uprights 8 towards one another, whereby the seat 5 is clamped in place between the uprights 8.

[0026] The seat 5 also acts to positionally fix the construction. When the seat 5 is placed under downwardly directed loading, the curved rails 9 are also placed under loading. The configuration of the curved rails 9 and the configuration of the downwardly open profile in the seat 5 contribute to the leg frame being held in place in the profile on the underside of the seat 5. To the extent the curved rails 9 flex downwards during the loading, this implies only that the rear legs 7 are urged harder against the guides 16 on the seat 5.

#### DESCRIPTION OF ALTERNATIVE EMBODIMENTS

[0027] In the preferred embodiment, only the seat is provided with a cushion or pad. It is also conceivable that the back portion 2, principally the back support 3, be provided with corresponding upholstery. One possible method is to provide the back support 3 with corresponding snap connections, but the upholstery may also be glued in place or be disposed in position by other means.

[0028] The present invention should not be considered as restricted to that described above and shown on the Drawings, many modifications being conceivable without departing from the scope of the appended Claims.

#### Claims

1. A chair (1) comprising a leg frame, a back support (3) and a seat (5), characterised in that the leg frame consists of two separate halves, each one of

them extending in beneath the seat (5) from each side thereof and being secured in a body portion of the seat (5) by means of snap- or insert connections.

2. The chair (1) as claimed in Claim 1, characterised in that the underside of the seat (5) is provided with undercut recesses (17, 18, 19) for accommodating those parts (10, 11, 12) of the leg frame which extend in beneath the seat (5).
3. The chair (1) as claimed in Claim 1 or 2, characterised in that those parts of the leg frame which extend in beneath the seat (5) have at least one manifest curve (13, 14).
4. The chair (1) as claimed in any of Claims 1 to 3, characterised in that parts of the leg frame which extend in beneath the seat (5) from each side of the chair substantially lie in one plane.
5. The chair (1) as claimed in any of Claims 1 to 4, characterised in that the back support (3) has downwardly open accommodation spaces (30) for accommodating two non-parallel uprights (8) which extend upwards and outwards; one from each half of the leg frame.
6. The chair (1) as claimed in Claim 5, characterised in that the uprights (8) are secured in the rear corners of the seat (5) by means of snap- or insert connections (16).
7. The chair (1) as claimed in any of Claims 5 or 6, characterised in that the back support (3) urges the two uprights (8) towards one another; and that they are held in place in this position with the aid of the friction between the uprights and the inner defining surface of the accommodation spaces (30).
8. The chair (1) as claimed in Claim 2, characterised in that the recesses (17, 18, 19) have substantially straight edges, a rounded bottom and a plurality of locking heels (20) for retaining the leg frame in the recesses (17, 18, 19).
9. The chair (1) as claimed in any of the preceding Claims, characterised in that the body portion (15) of the seat (5) is provided with reinforcing springs (23, 24) on its upwardly directed side.
10. The chair (1) as claimed in any of the preceding Claims, characterised in that the seat (5) has a removable pad or cushion (25) which is secured in the body portion (15) of the seat (5) with the aid of snap connections (28, 29) and which rests against the reinforcing springs (23, 24).

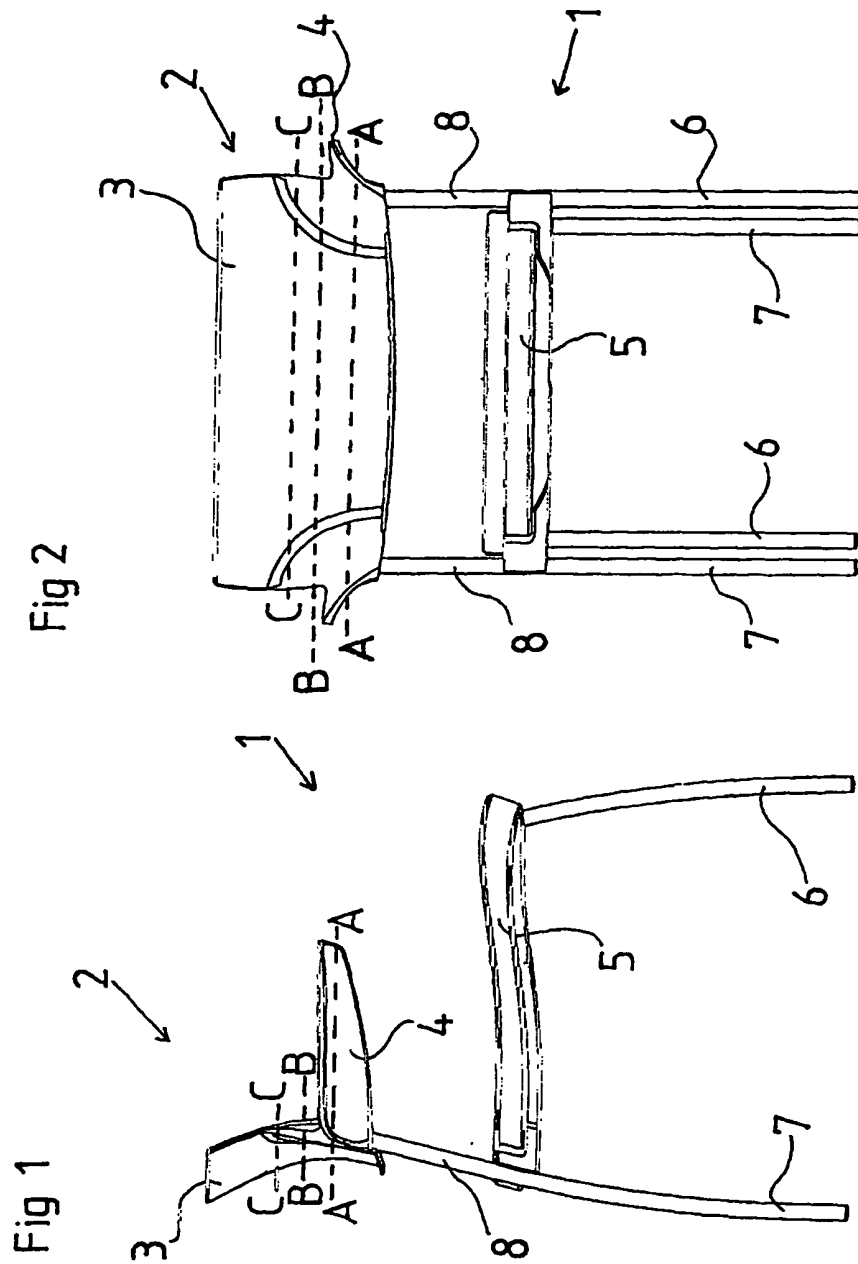


Fig 3

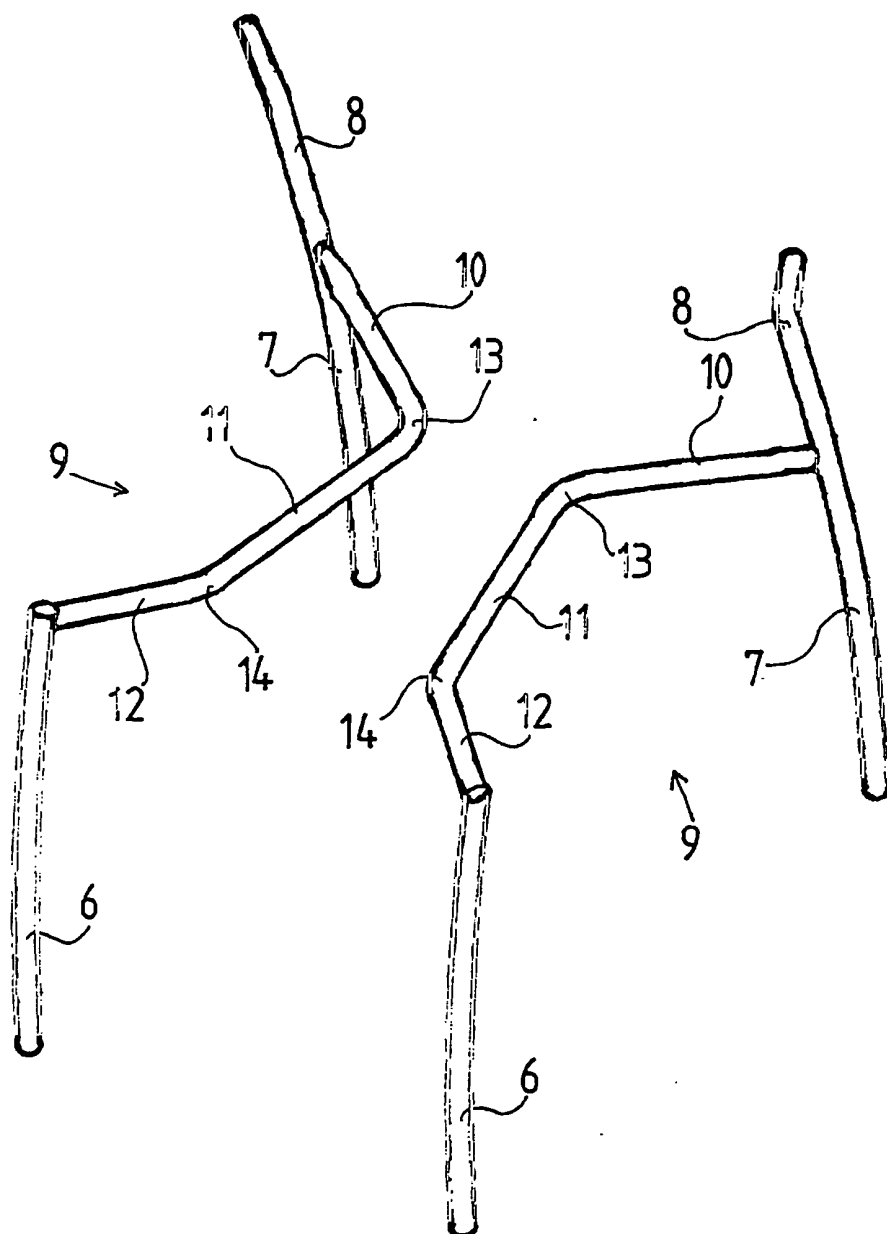
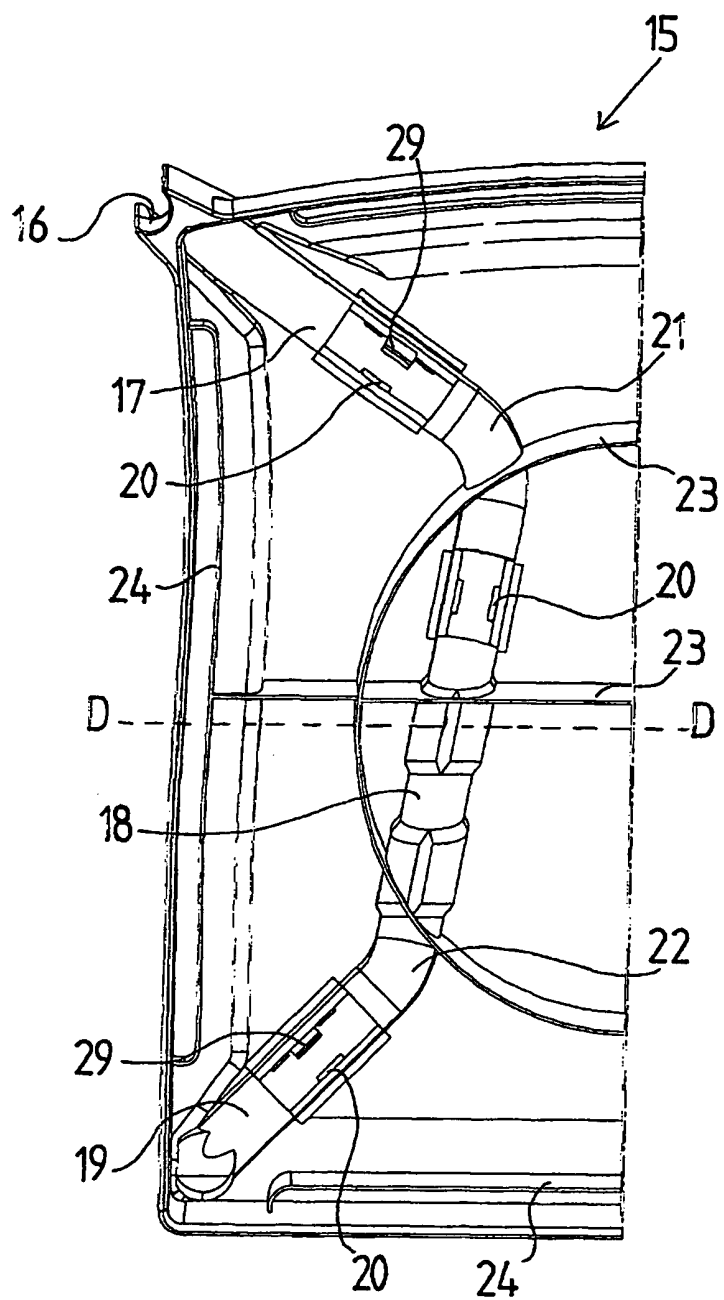


Fig 4





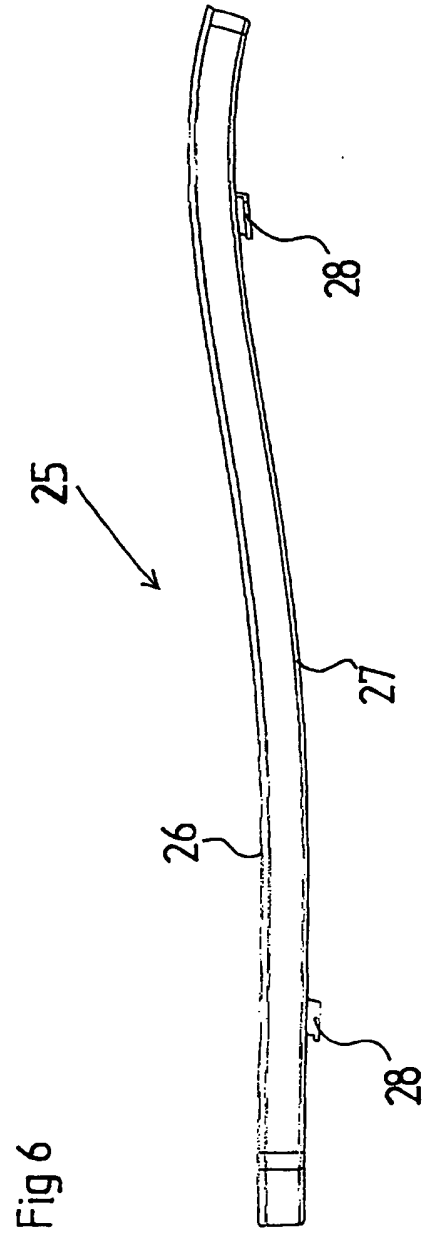
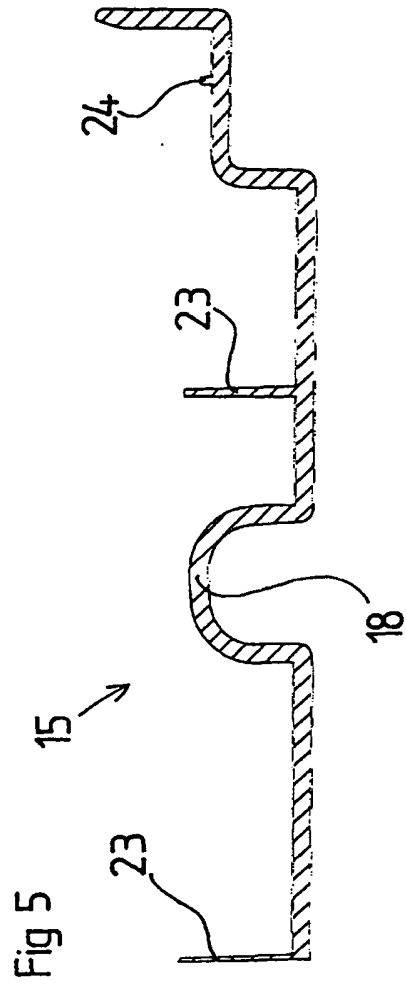


Fig 7a

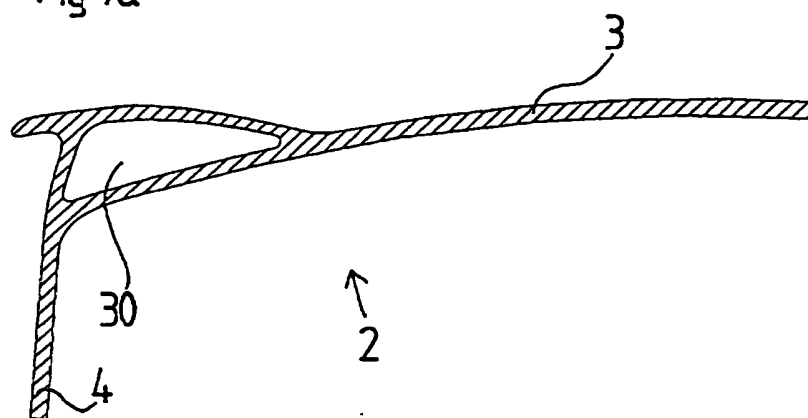


Fig 7b

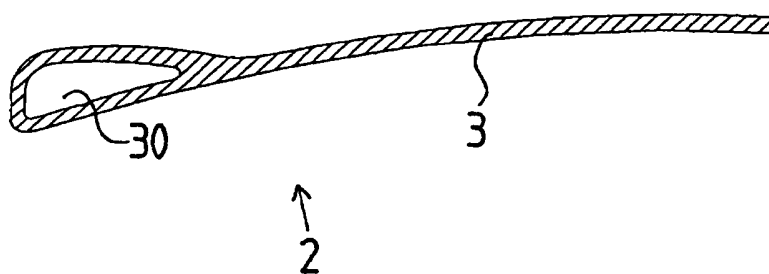
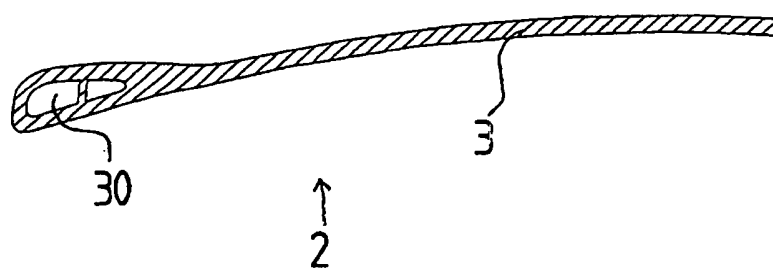


Fig 7c





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## EUROPEAN SEARCH REPORT

Application Number  
EP 00 20 3832

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 2 876 828 A (NATHAN MAYER) 10 March 1959 (1959-03-10)	1, 4, 9	A47C4/02 A47C5/06
Y	* column 2, line 41-70; claim 1; figures 1, 2 *	2, 3, 5-8, 10	
Y	US 2 815 801 A (ZENITH PLASTICS COMPANY) 10 December 1957 (1957-12-10) * column 1, line 36-39, 49-51 * * column 2, line 10-20; claim 1; figures 1, 2 *	2, 3, 8	
Y	GB 2 264 229 A (KETER PLASTIC LTD) 25 August 1993 (1993-08-25) * page 4, line 1-5; figure 1 *	5-7	
Y	DE 33 21 410 A (LINK WILHELM KG) 20 December 1984 (1984-12-20) * claim 1; figures *	10	
X	FR 1 249 540 A (ALFRED ALBELLA) 20 March 1961 (1961-03-20) * claims; figures *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) A47C
A	US 5 845 962 A (LIN FANG-SHENG) 8 December 1998 (1998-12-08) * abstract; figure 1 *		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 12 February 2001	Examiner Amghar, N
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 00 20 3832

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12-02-2001

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